



Growing Native Plants

No.12



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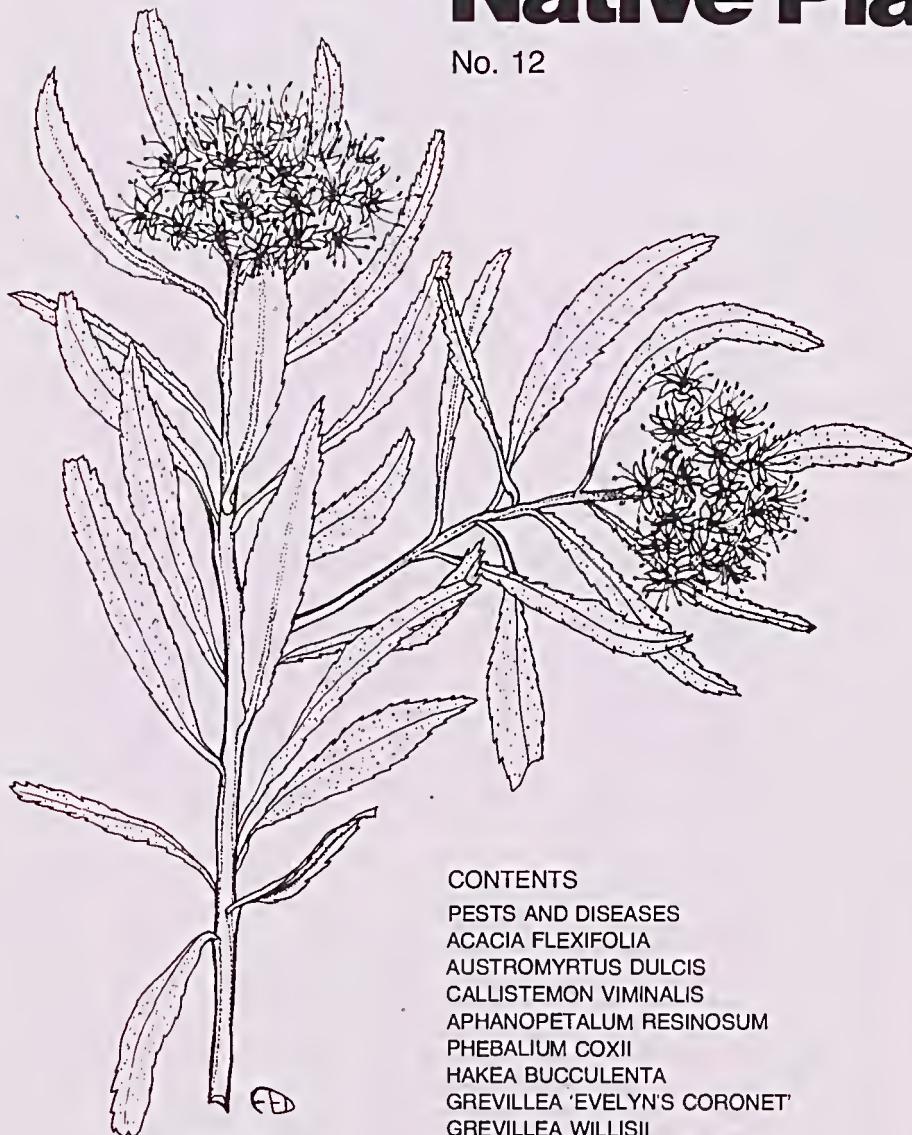
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National Botanic Gardens

Growing Native Plants

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Phebalium coxii

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PESTS AND DISEASES

In the altered environment of a home garden many of the natural forces that control pests and diseases are missing and some chemical or physical methods of control may be necessary.

There is often, however, an over-reaction to pests and diseases. While some may be quite harmful the majority will be harmless or cause only minor damage. In these cases very simple controls may suffice or perhaps no control measures may be necessary. Gardens composed mainly of Australian native plants attract a range of native birds, which provide a natural control of insect populations and serve as an added feature in the garden.

Before attempting to control a pest or disease it is important to identify the problem correctly. Once this is done a suitable method of control can usually be selected. When looking at unhealthy plants it should be kept in mind that they may be suffering from more than one problem and a number of control measures including pruning, spraying and/or fertilising may need to be adopted.

If there is a need to apply a pesticide, make sure the chemical will control the pest or disease causing the damage. Read the label on the container and follow the directions carefully.

Spraying should be avoided on hot, wet or windy days. Protective clothing consisting of gloves, boots, overalls and a hat should be worn, to prevent spray contacting the skin. A respirator is also recommended when spraying in confined spaces. As a further precautionary measure a thorough wash with soap and water is advised after completion of spraying.

FUNGUS DISEASES

These occur quite commonly on native plants and may be seen in many different forms.

Damping-off

Damping-off fungus is most detrimental to seedlings causing them to collapse. A close examination will reveal that the stem at soil level has rotted.



Honey fungus, *Armillaria mellea*, on a tree stump.

The fungus will spread rapidly through a tray of seedlings and control sprays of Thiram® or Previcure® should be applied without delay. The problem can usually be avoided by sowing seed thinly to allow adequate ventilation, using a well-drained sterilised soil and by watering by capillary action from underneath. (Refer: *Growing Native Plants* No. 2 p. 28).

Honey fungus or Armillaria

Mature shrubs and trees may be attacked by this fungus entering through the roots or wounds close to ground level. Plants that have been attacked become unthrifty and partly defoliated, often with bunches of honey-coloured toadstools around the base of the trunk. Some practices encouraging *Armillaria* are raising the soil level around tree trunks, excavating close to large trees and shrubs and damaging bark with mowers and other equipment. Honey fungus often infects old stumps so it is sound practice to remove these from the garden to avoid infection.

Leaf spot

Many species of plants are attacked by leaf spot fungi. These spots are often black and can almost cover the leaf surface in severe cases. A number of the broad-leaved *Hakea* species are especially susceptible and heavy defoliation may result.

Control can be aided by burning the leaves that have fallen from infected plants and spraying with captan or zineb.

A spreader should be omitted when spraying *Hakea* spp.

Powdery mildew

This is a grey fungus that can be seen as a thin powdery layer covering new growth and often causing distortion in severe cases. This disease is most prevalent during the cool moist autumn weather. If foliage is severely damaged, Karathane® can be used for control.

Root rot or phytophthora

Infection by this soil-borne fungus often results from poor drainage. Susceptible plants may die suddenly during hot weather, often showing signs of severe wilt. Root rot can be largely avoided by carefully selecting resistant species and/or by planting in raised, freely draining garden beds. Soil drenching with Ridomil® or Terrazol® may be useful to save a particularly prized specimen.

Rust

Rust can usually be seen as small red-brown lumps on the under-surface of leaves. Although it may infect a wide range of native plants some species are more susceptible than others. The Australian hollyhock *Lavatera plebeia* is commonly seen covered in rust and serious problems have also been experienced in the Botanic Gardens with *Senecio lautus* subsp. *maritimus*.

This disease can be difficult to control and the best practice is to remove and burn infected plants.

BACTERIA AND VIRUSES

These are also known to attack native plants. Symptoms include wilting, galls, foul-smelling rots, stunting, mosaic, yellowing and witches' broom. Control measures are difficult and infected plants should be destroyed. Aphids and other sucking insects spread virus infections and therefore controlling these will help to contain the disease. Vegetative propagation can also spread these diseases, so material should not be collected from any infected plants.

PLANT PARASITES

Plants that depend on others for all or most of their nutrition fall into this category; some of the more common ones are mentioned here.

Dodder (*Cassytha* spp.)

This slender leafless vine may attach itself to a wide range of host plants. Although it grows initially in the soil, it soon becomes completely dependent on the host plant. If dodder is left unchecked for any length of time, whole shrubs can be engulfed and it will quickly spread to others growing along side. For mild infestations the best method of control is pruning. With heavy infestations, it is easier to remove and burn the affected plant. Dodder is difficult to remove entirely and shrubs will need to be inspected regularly after the initial pruning.

Mistletoe

This leafy parasite has no roots and depends entirely on the host for moisture and dissolved nutrients. It is commonly seen growing in eucalypt trees but will also occur on other plants. Heavy infestations can kill the host;

Powdery mildew on *Hardenbergia violacea*.



Cassytha pubescens—a dodder common in the Canberra region, showing the fruits, the insignificant flowers and the haustoria which attaches it to the host plant.

however the usual result is for the branch to die back from the tips to where the mistletoe is attached. Where control is required the whole branch should be removed.

Orobanche sp.

This unusual leafless parasite has no chlorophyll and is therefore devoid of green colouring. Flowering stems may arise annually amongst leaf litter, under shrubs in ground covers or in unkept grass areas. Plants may occur singly or in large clusters. *Orobanche* appears to have no visible effect on the host plant; however it

may look unsightly, particularly as it begins to age. Where *Orobanche* is regarded as a nuisance, the flowering stems should be pulled out and disposed of before seed is set.

PLANT PESTS

Pests of plants include such things as dogs, cats, birds, insects, snails, slugs and millipedes. Of these, insects are by far the most important.

Insects go through a number of stages in their life cycle and during some of these stages they can cause more damage than in others. For example, a butterfly egg will hatch into a voracious caterpillar devouring large quantities of food. It will then go through a resting or pupal stage to emerge as an adult butterfly. The adult may then do little more than sip nectar from flowers and mate to start the cycle again.

It can be important to recognise the different stages of an insect's life, as control measures may be timed or directed towards one of them.

Common insect and other pests

Aphids

These may attack many different plants but are mostly associated with soft young foliage, particularly on herbaceous or annual plants. Stunted, curled or deformed foliage is often a sign that aphids are clustered under the leaves. During favourable conditions aphid numbers can build up rapidly and early control is advisable. Malathion, Rogor® or pyrethrum sprays can be used effectively.

Borers

These are the larval stage of some beetles, weevils and moths. They may vary from the tiny tip borer moth on *Callistemon* to the large 'witchetty' grub that attacks *Acacia* and *Casuarina* species. Fras or sawdust around the base of a plant is usually a sign of borers and plants weakened by them can snap off during a storm. If the entrance holes are located, good control can be achieved by injecting a mixture of 50 gm of Dipterex® or malathion to 2 litres of methylated spirits into holes.

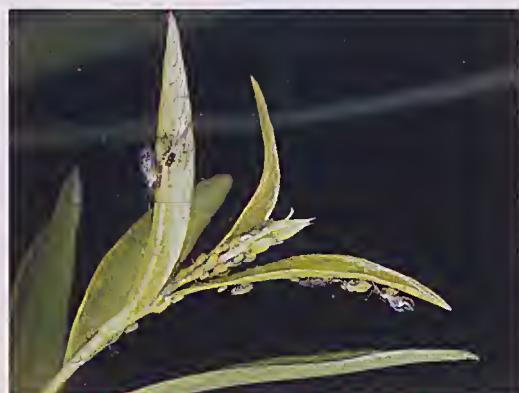
Caterpillars

These are the larval stage of butterflies, moths or beetles. They are commonly found during spring and warmer months. Most caterpillars live on specific groups of host plants, e.g. eucalypts, grevilleas, acacias etc., and they will feed only on certain parts of that plant such as flowers, seeds, leaves or stems. If caterpillars are causing severe damage they can be controlled easily if the spray reaches them or the material on which they are feeding.

Carbaryl or Dipel® are suggested for control on plants and pyrethrum dust can be used with stored seed. •



Orobanche minor, a leafless root parasite.



Aphids clustered on the tender young growth of *Sollya heterophylla*.



Fras or 'sawdust' indicating the presence of borers.

Leaf-eating beetles and their larvae

These are most troublesome during spring and early autumn when new growth is fresh and succulent. Young trees from 1 to 4 m can be severely defoliated though trees over this height



Sawfly larva, *Perga* sp., cluster together by day and disperse to feed at night.

usually only suffer minor damage. In some instances, e.g. Christmas beetles, large numbers can appear quite suddenly and almost devour a young tree.

Carbaryl or malathion can be used for effective control but may need to be applied several times during a season.

Lerps or psyllids

These sucking insects are found on eucalypt trees. The white sugary cover over the insect may give the tree a rather snowy appearance during summer. The intensity of attack by lerps varies from year to year and species to species. Heavy infestations may cause severe defoliation or even death where a tree is also under stress from other factors such as drought. On smaller trees control is possible using Rogor® but large trees are difficult to treat and may be best left to recover on their own.

Mites or red spider

It is difficult to see these small wingless creatures with the human eye. When large numbers build up, plants take on an unthrifty chlorotic look. Close examination of the leaf under-surface with a hand lens should confirm the presence of mites. Indoor plants often become infested especially if conditions become dry and dusty.

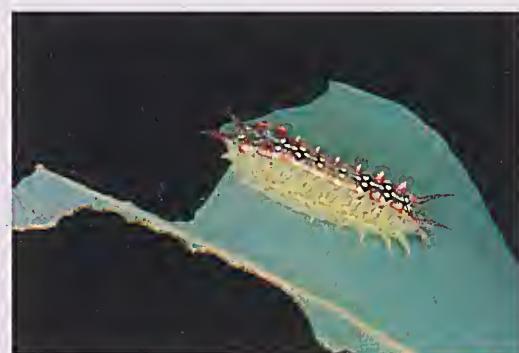
Omite®, Rogor® and Kelthane® can be used for control taking care to spray the under-surface of the leaves.

Sawfly

The most common sawfly seen around Canberra is the steel blue sawfly. Clusters of black larvae can often be found on thin eucalypt branches. When disturbed they raise their heads and tails and spit a strong-smelling liquid. If sawfly larvae are causing serious damage, the easiest method of control is to cut off the small limb on which they congregate and dispose of it. Failing this carbaryl or a household insecticide can be used.



Lerp on a eucalypt leaf showing the white sugary cover over each psyllid insect.



Cup moth larva, *Doratifera* sp., a caterpillar which can cause skin irritation.

Scale

There are many species of scale insects and most are confined to a particular host plant. Often the first sign that a plant has scale is the black sooty mould fungus that lives on the sweet secretions exuded by these insects. Sooty mould may make a plant look unsightly; however it will disappear when the scale has been controlled.

Scale is easiest to kill when young and active (during September–October). At this stage Rogor® or malathion mixed with white oil can be used effectively.

Sucking insects or bugs

There are many species of sap-sucking insects which at times may accumulate to large numbers.

One 'bug' that often causes serious damage is the Acacia bug. These small winged insects are rarely seen, but the damage they do to the 'broad-leaf' (phyllodineous) acacias may cause serious defoliation or death of a plant. Small

brown round or rectangular patches are seen on the leaves where the *Acacia* bug has been feeding. When the leaf is covered with a number of patches it falls.

Rogor® applied frequently throughout spring and summer should give good control or alternatively the wattle may be replaced with another that has divided or bipinnate leaves.

Thrips

These small winged insects are seen mostly on broad-leaved trees and shrubs but can occasionally be found on fine-leaved species. Large numbers of the tiny insects rasp away the outer covering of both upper and lower leaf surfaces. As a result the leaf takes on a bleached or silvery appearance. Total defoliation can occur as severely damaged leaves drop off.

Rogor®, malathion or pyrethrum can be used for control.

Webbing caterpillars

Leptospermum spp. and *Melaleuca* spp. are the main hosts for this pest although other small myrtaceous plants can be attacked. Colonies of larvae spin protective nests and forage out from these during the night. Nests are constructed initially at the base of a shrub, then further up and out as defoliation takes place. A high pressure hose can be used effectively to blast nests off shrubs or alternatively sprays of carbaryl or Dipel® can be used.

Damage caused by webbing caterpillars on *Melaleuca hypericifolia*.



Thrip damage seen on the left side of a *Tasmannia purpurascens* leaf.



Damage caused to three different *Acacia* species by the Acacia bug, *Eucerocoris tumidiceps*.



Eucalyptus scale insects with the associated blackened leaves caused by sooty mould.

OTHER CAUSES OF PLANT DETERIORATION

Chemical injury

Too much fertiliser applied close to the base of a plant can cause fertiliser burn or a white exudation on the leaves. Careless use of weedicides can also damage desirable plants and cause them to look chlorotic or burnt. Plants with delicate foliage can also be damaged by sprays applied at normal strength.

Fasciation

This is often seen as a flattened fan-shaped growth on an otherwise normal stem. Other plant parts that can also be fasciated include fruits, flowers, underground stems and roots. There are several possible causes of fasciation: attack by insects, influence of season, low temperatures, fungi, bacteria, viruses and high nutrition.

If fasciation is regarded as detrimental to the appearance of the plant, and this is not always so, pruning back to normal growth may remove the problem.

Frost injury

Very sensitive plants quickly take on a burnt or soft black appearance and may be killed outright. On slightly sensitive plants only the growing tips are burnt back and they will recover in spring. Where plants are frost tender only during their first few years, hessian covers can be constructed to give protection. It is important to have these covers in place before frosts begin, as the early frosts often cause the most damage. These covers should be removed during the day to enable adequate light and ventilation to be received by the plant.

Galls

These can be many varied shapes and sizes and may be caused by a number of different pests, including insects, fungi, bacteria and nematodes. Galls consist of abnormally swollen plant tissue and are mainly found on leaves and stems. Occasionally flowers, buds and roots can also be covered. Control measures depend on determining the cause of the gall. The recommended remedy in many cases is to prune the infected parts of the plant or, in cases where there is severe damage, replace the plant.

Mechanical injury

Lawn mowers can leave a plant ring barked where grass is mown right up to the stem. Poor pruning techniques can damage plants, allowing disease entry and causing limbs to die back.

Mineral deficiencies

These tend to show up in the leaves. Plants are often spindly and chlorotic. See *Growing Native Plants* No. 9 pp. 202-6 for further information.



Frost damage showing 'burnt' wilted leaves.

Sun scorch

This can often occur on plants brought suddenly from heavily shaded or humid conditions to a bright hot, dry situation. If soil around the plant is kept moist and shading is reduced gradually, scorching will be held to a minimum.

Peter Ollerenshaw

® = Registered trade name.

Further information on the control of pests and diseases can be found in the following publications.

Dept of the Capital Territory. *One Sheet Answers*.

Hadlington, P. W. and Johnston, J. A. *Australian Trees. A Guide to their Care and Cure*. N.S.W. University Press (1979).

Hocking, F. D. *Friends and Foes of Australian Gardens* A. H. and A. W. Reed (1980).

Pirone, Pascal, P. *Diseases and Pests of Ornamental Plants*. John Wiley and Sons, New York (1978).

Wescott, Cynthia. *Plant Diseases Handbook*. Van Nostrand Reinhold, New York (1971).



Galls on eucalypt leaves caused by wasps.

ACACIA FLEXIFOLIA



The inclusion in a garden of at least some plants to provide colour during bleak winter months is an essential part of any landscape design. *Acacia flexifolia*, the bent-leaf wattle, is such a plant, with the added advantage that it is a small shrub. This makes it a very useful species for planting in some of the smaller spaces in the garden.

A. flexifolia occurs naturally from an area just near Stanthorpe in Queensland through western New South Wales to the Bendigo region of Victoria. The natural habitat is mainly open eucalypt woodland to whipstick scrub areas.



This species will grow into a shrub 1.5 m tall by 2 m across. Even where it occurs naturally the plant is quite dense, a habit which makes it an excellent subject for gardens where a minimum amount of maintenance is desired.

Some specimens have glaucous phyllodes, which give the shrub a grey appearance, from a distance. These glaucous forms are good ones to select for horticulture as the grey foliage will contrast well with adjacent green foliage plants.

The lemon-yellow¹ flowers are fragrant and borne in small globular heads arising from the leaf axils. The individual flower heads are small but carried in dense profusion along the stems. The flowering season starts in May and can extend to October.

While occurring naturally in dry, sunny situations, *A. flexifolia* is very adaptable. At the National Botanic Gardens some specimens are growing in heavy, moist soil in a semi-shaded situation yet they flower regularly each year. These shrubs, however, are showing some sparseness as they age due to the low light intensity. The best specimens can be expected from freely drained soil with plenty of light.

The shrub tolerates pruning, which may be carried out each year after flowering. Pruning helps to keep the plant even more compact than it is in its natural habit.

A. flexifolia has been known in cultivation for many years, though it is not widely grown. It can occasionally be obtained from nurseries and garden centres.

Propagation is generally from scarified seed, though it is possible to grow this species from cuttings.

No pests have been noted.

A. flexifolia is frost and drought hardy, which is advantageous for places where supplementary watering is not always possible, for example in rural plantings.

It is also a useful subject for small home gardens, as informal low hedging and for larger rock gardens.

Geoff Butler

¹ RHS Colour Chart, 1966: flowers, yellow Group 3A.

Acacia *flexifolia*:

Acacia—the Greek name for the tree *Acacia arabica*. Derived from the Greek, *akis*, a sharp point; *flexifolia*—from the Latin, *flexus*, bent, and *folium*, leaf.

AUSTROMYRTUS DULCIS



Distribution

There are at least eleven species of *Austromyrtus* endemic to Australia, the majority occurring on the east coast from central New South Wales to northern Queensland. They are small trees or shrubs and can be found in woodlands, heath, forests or rainforest fringes.

Austromyrtus dulcis, midgen berry, occurs commonly from Byron Bay, NSW, to Fraser Island, Queensland, as a spreading shrub up to 2 m tall. Its most frequent occurrence is in sandy soils in heath, scrub or open forests and occasionally on the margins of rainforests.

The leaves of *A. dulcis* are glossy dark green lanceolate 9–30 mm long by 3–10 mm wide with numerous conspicuous oil glands. They are arranged in opposite rows. The under-surface of the leaves has a dense covering of appressed hairs giving it a pale appearance. The young coppery coloured growing shoots are densely silvery hairy.

The flowers are 7–10 mm in diameter and have white¹ ovate petals. They are usually borne in clusters of 2–5 flowers in the upper

axils, although solitary flowers are also common. In its natural habitat *A. dulcis* flowers in spring and summer while in Canberra the flowering time is summer to mid-autumn.

An attractive period for the plant is the fruiting stage. The fruits are berries containing 3–9 pale brown seeds. They are white and covered in small blue black spots, giving the fruit a mauvish appearance. The fruit are edible and have a sweet taste.

A. dulcis is a relatively easy species to propagate. Fresh cleaned seed germinates in 3–4 weeks while uncleared fruits take about a week longer. Although the testa of the seed is hard no mechanical scarification is necessary. Propagation from cuttings is also easy.

The species has been performing well in cultivation at the National Botanic Gardens as a low shrub on the margins of the rainforest gully. In full sun it forms a dense spreading shrub up to 40 cm high by 1.4 m in diameter, while in more shaded areas it becomes a more open ground cover. It forms an excellent shrub in sandy coastal situations where not directly exposed to salt winds.

Other requirements for culture are an assured moisture level and some overhead tree shelter in areas of severe frosts.

Little maintenance is required and pruning is only necessary to achieve a particular shape, i.e. a low hedge. The plant appears relatively free from pests and diseases.

Ron Jackson

¹ RHS Colour Chart, 1966: petals white group 155B.

Austromyrtus dulcis:

Austromyrtus—is derived from the Latin, *australis*, southern and *myrtus*, the Greek name for myrtle;

dulcis—is Latin for sweet.



CALLISTEMON VIMINALIS



The genus *Callistemon* has provided many fine horticultural specimens. They are generally noted for their flowers, adaptability and quick growth. The weeping bottlebrush *Callistemon viminalis* is a very fine example of the group.

C. viminalis occurs naturally on the east coast of Australia from Cape York to the Hunter Valley in New South Wales. It is more common along watercourses on the coastal plains where it forms a shrub or small tree up to 8 m tall; larger specimens up to 18 m tall have also been recorded. It also extends to the tablelands and occasionally to the western slopes of the Great Dividing Range.

The leaves of *C. viminalis* are lanceolate 3–6 mm wide by 40–70 mm long but northern forms have a more elliptical-shaped leaf. The flowers are borne in spikes 40–150 mm long with prominent red¹ stamens 15–25 mm long. Petals are greenish or pale coloured, tiny, inconspicuous and in some cases deciduous. Peak flowering time is late spring and it is common for the species to flower in spring and autumn or bear small numbers of flowers all year. Fruits are 5–6 mm in diameter and the seed is held for a few seasons. New growth emerges from the ends of the inflorescence and the young leaves have bronze-coloured hairs.

C. viminalis is extremely adaptable in cultivation. For optimum results it should be planted in moist well-drained soil in full or partial sun. The species is susceptible to frost damage while small and suitable protection is necessary. *C. viminalis* will grow in heavy waterlogged soils, in shady wet situations or even arid climates where there is sufficient supplementary watering.

It is a valuable species in landscaping, being useful as a screen plant, in erosion control or as a specimen or street tree, where it exhibits smog tolerance. In coastal situations it should not be exposed to severe salt spray.

No cultivars of *C. viminalis* have been registered by the Australian Cultivar Registration Authority to date. Some of the more common

forms available currently are listed below with data extracted from nursery catalogues.

C. viminalis 'Captain Cook'—A dwarf compact shrub 1–2 m high, with glabrous new growth and masses of flowers 150 mm long borne over long periods. Very effective as either a single specimen or a low hedge.

C. viminalis 'Rose Opal'—A compact dense shrub 1.5–1.8 m high. The stamens are a rosy red colour.

C. viminalis 'Dawson River Weeper'—A quick-growing rounded shrub up to 4 m by 4 m with an exceptionally weeping habit. The flowers are dark crimson and sometimes obscured in the olive-green foliage.

C. viminalis 'Hannah Ray'—A shrub 4 m tall by 2 m wide with scarlet brushes.

C. viminalis 'Prolific'—A small, fast-growing tree 4–6 m high by 4 m wide with large red brushes.

C. viminalis 'Hen Camp Creek'—A shrub 3–4 m high by 2 m wide with red flowers in spring and autumn.

C. viminalis 'Wild River'—A semi-weeping form from North Queensland 4 m high by 2 m wide with brilliant red brushes.

Callistemon can be propagated easily from seed which falls readily from mature fruit capsules when dry. (See *Growing Native Plants* No. 2). Cuttings of semi-hardened material also strike easily and it is necessary to adopt this propagation technique to maintain particular forms.

Pruning is recommended after flowering to remove most of the spent flowers and encourage an attractive growth habit.

As with other members of the genus *Callistemon*, *C. viminalis* may suffer attacks by scale insects, thrips and occasionally sawfly larvae. A mixture of white oil and malathion will control scale and thrips and sawfly larvae will be checked by carbaryl.

Ron Jackson

¹ RHS Colour Chart, 1966: stamens red group 46B.

Callistemon viminalis:
Callistemon—from the Greek, kallistos,
most beautiful and stema, a stamen;
viminalis—from the Latin, vimen, a long
flexible shoot or osier.



APHANOPETALUM RESINOSUM



Aphanopetalum resinosum is a member of the family Cunoniaceae and was first described by the Austrian botanist Endlicher in 1839. It is a twining climber found in rainforest or wet forest areas of Queensland and New South Wales. *A. resinosum*, or gum vine, is one of two species of this genus, both of which are endemic to Australia. The other species, *A. clematideum*, has a limited distribution in Western Australia between Geraldton and Fremantle. A closely related genus is *Ceratopetalum* which includes the NSW Christmas bush, *C. gummiferum*.

The foliage of *A. resinosum* is most attractive as the opposite leaves are a dark glossy green and up to 100 mm long. Leaf shape varies from ovate to lanceolate with bluntly toothed margins.

Flowers are greenish yellow¹, 12 mm in diameter, and arise from the leaf axils in short cymes or loose panicles. The flowers appear to have 4 petals but these are in fact the sepals which enlarge to enclose the fruit as it develops. The petals are absent or minute, and flowering time is usually late spring to early summer. The fruit is a nut which is surrounded by the persistent calyx.

Another identifying feature of this plant is the raised resinous dots on the stems.

A. resinosum is a useful foliage plant for shaded corners of the garden, with the added features of delicate flowers and attractive fruits. As a stem twiner it needs support to raise itself above ground level but if a rambling habit is preferred it will fulfil this role.

A well-composted soil is required and a light dressing of complete fertiliser in the spring should help maintain glossy healthy foliage. The plant is frost hardy and no pests or diseases have been noted in the National Botanic Gardens. If the plant becomes woody and the foliage sparse with age it will respond well to heavy pruning. This is particularly relevant if the plant is used as a basket specimen. Heavy pruning should be undertaken prior to strong growth flushes, such as early spring and in summer after flowering. When used as a basket

specimen the frequent application of a liquid fertiliser is advantageous.

A. resinosum can be propagated easily from semi-hard cuttings. It may also be propagated from seed if sown when fresh. It is not necessary to remove the persistent calyx lobes.

Fred Howe

¹ RHS Colour Chart, 1966: close to yellow-green group 150D.

Aphanopetalum resinosum:

Aphanopetalum—from the Greek, *aphanes*, inconspicuous, and *petalon*, petal; *resinosum*—is Latin for resinous.



PHEBALIUM COXII



Distribution

Phebalium coxii, a member of the Rutaceae family, has only recently been brought into cultivation. Once thought to be restricted to the summit of a single mountain in the Budawang Range, it is known now to be more widespread, occurring along nearly 100 km of the Southern Tablelands escarpment. Rare, but locally common, the plant grows in rocky terrain, often on steep slopes.

P. coxii may be either single or multi-stemmed and in the field grows 5 m high. The leaves are dark green, narrow, elliptical, up to 70 mm long with a finely serrated margin towards the apex. Like those of all members of the family the leaves are distinctively aromatic. A. R. Penfold in 1925 stated that 'the leaves on crushing between the fingers readily emit a delightful fruity odour, which very closely resembles that of the luscious passion fruit (*Passiflora edulis*)*'.

P. coxii should be planted where there is good drainage and some shade and mulched to ensure a cool root run. Once established it

is fast growing and hardy, often developing a pyramidal shape. The deep pink flower buds clustered together in groups of 10-30 at the top of a branchlet open during September and October to form creamy white¹ masses over the outside of the plant. The fruit is capsular, splitting to release 2-5 kidney-shaped seeds in late December.

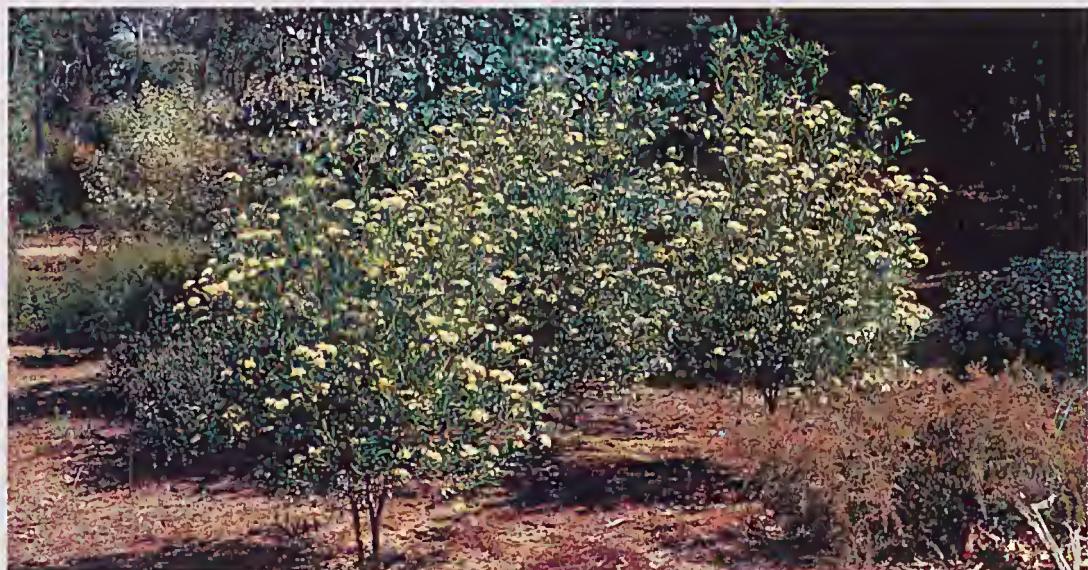
Cuttings are the most suitable method of propagation. Complex dormancy problems make seed germination unsatisfactory. Cuttings are best taken in December or January from semi-hardwood growth and will usually strike within two or three months.

P. coxii is generally free from pests and diseases. Spraying with white oil and an insecticide will control any attack of scale.

Julia Rymer

¹ RHS Colour Chart, 1966: petals, green-yellow group 1d; stamens, yellow group 13b.

Phebalium coxii:
Phebalium—is apparently from the Greek, phibaleos, a fig, the reason being obscure;
coxii—named after Dr J. C. Cox of Sydney.



HAKEA BUCCULENTA



The genus *Hakea* includes about 140 species, all endemic to Australia and varying greatly in habit, leaf shape and flower colour. One of the most colourful and distinctive is *Hakea bucculenta* from Western Australia. This upright narrow-leaved shrub with its tapered orange-red¹ flower spikes 60–100 mm long presents a superb visual effect, and is referred to commonly as red pokers.

In its natural habitat, the northern sand plains from Geraldton to Sharke Bay, *H. bucculenta* has been recorded as reaching a height of 7 m and flowering from June to October.

In cultivation it rarely exceeds 4 m and a fine specimen in the National Botanic Gardens has reached this height in nine years. Buds on this plant form as early as February, and in March green flower spikes develop. These spikes gradually colour and in April a fan-like cluster of flower spikes emerges.

The narrow linear leaves 100–200 mm long with blunt ends extend in an open fashion from the tip right down the length of the stem and are quite graceful. They do not detract from or hide the flower spikes, which are borne on old wood.

Although in the wild it is a prolific seed bearer, in cultivation at the National Botanic Gardens few fruits are formed. These are woody capsules about 22 mm long and 15 mm wide and are closely attached to the stem. The seed is retained on the plant, being released following a bushfire or the death of the plant.

Propagation is easiest from seed which germinates in 3–4 weeks. Cuttings have also been successful but a high percentage strike is rarely obtained. (Ref. *Growing Native Plants No. 2*).

H. bucculenta appears to be free of insect pests. Both birds and bees are attracted to its flowers. Parrots feed on the flowers, often causing considerable damage; they have also been known to eat the fruits.

Good drainage is essential as the plant is

Hakea bucculenta:

Hakea—after Baron von Hake, a German patron of botany;
bucculenta—from the Latin, *bucca*, with full cheeks, probably referring to the swollen sides of the fruit.



susceptible to the fungus *Phytophthora cinnamomi*.

H. bucculenta grows well with other shrubs which will tend to provide support from wind, to which it is quite susceptible. A position in full sun produces best flowering and a compact habit whereas growth in shade has a tendency to be sparse with poor flowering.

The species tolerates dry conditions and has proved frost resistant in the National Botanic Gardens.

In spring when new growth appears, a light dressing of a general fertiliser can be given, and the plant will benefit from a mulch of leaf litter or similar mulching material. Care should be taken to ensure the mulch is kept away from the trunk to avoid providing conditions conducive to collar rot.

H. bucculenta is an excellent subject for a feature plant in any garden.

Nora Ollerenshaw

¹ RHS Colour Chart, 1966: flowers, red group 50A.

GREVILLEA

'EVELYN'S CORONET'

Many excellent cultivars of Australian plants are now becoming available to the general public.

Grevillea 'Evelyn's Coronet' is one of the many cultivars from the genus *Grevillea*. It is very hardy and reliable. This cultivar arose as a chance hybrid seedling between *G. lavan-dulacea* and *G. buxifolia* in a garden at Lane Cove in Sydney in 1972. The cultivar has grown well in quite heavy soils in the National Botanic Gardens since 1976.

Grevillea 'Evelyn's Coronet' grows vigorously into a dense, erect shrub to 2 m tall by 1.5–2 m wide. The plant remains dense to ground level and responds well to annual pruning; 10–15 cm of the tip growth should be removed. This pruning helps to keep the plant more compact as it gets older and induces more buds to shoot, thus providing more flowering wood for the following season.

The inflorescences are very attractive. They are borne at the ends of the branches, and as a result stand out against the shiny green foliage. The individual flowers have a woolly appearance and are pink in colour with upright red-purple styles.¹ While each individual flower is fairly small, many are clustered together forming an inflorescence up to 30 mm across. Flowering occurs in spring and summer. The flowers last well when cut and placed in water, unlike many other grevilleas.

The leaves are sharp pointed and approximately 20 mm long and 3 mm wide, glossy green on the top surface and paler underneath. The under-sides of the leaves are covered with fine hairs.

As with the majority of cultivars, *G. 'Evelyn's Coronet'* must be grown by vegetative means. Cuttings taken from semi-hardwood material between December and March strike relatively easily in 7–10 weeks.

G. 'Evelyn's Coronet' would lend itself well for use as a short, informal screen plant but due to its beautiful flowering habit it is best used as a specimen shrub.

No diseases or pests have been noted yet in the National Botanic Gardens. It is frost hardy.

This cultivar was registered by the Australian Cultivar Registration Authority on 17 May 1977.

Geoff Butler

¹ RHS Colour Chart, 1966: perianth tube and limb, near red group 54C; style, greyed purple group 187C.

Grevillea 'Evelyn's Coronet':
Grevillea—after C. F. Greville (1749–1809), an English patron of botany; 'Evelyn's'—after Evelyn Hickey, in whose garden it arose at Lane Cove, Sydney; 'Coronet'—for the coronet-shaped terminal inflorescence.



GREVILLEA WILLISII



Grevillea willisii:

Grevillea—after C. F. Greville (1749–1809), an English patron of botany; *willisii*—named in honour of Dr J. H. Willis, a former Government Botanist of Victoria, for his services which have enriched the knowledge of the Australian flora.



Landscapers are continually searching for new species and varieties of plants with hardiness and adaptability, particularly for larger landscape projects such as surrounds of public buildings or parks. *Grevillea willisii* is a species most suited for this type of situation.

Although officially named only in 1975, its existence had been known for many years prior to this as the first recorded collection was made in 1882. *G. willisii* occurs naturally in a very confined locality near the Omeo district in Victoria. It grows into a large mounded shrub 2.5 m tall and can reach up to 4 m across. Quite often the size reached in cultivation can be larger than this.

This grevillea grows naturally in eucalypt forest among large granite outcrops and boulders, mainly on steep slopes. The drainage in these areas is good.

In cultivation at the National Botanic Gardens, the best plants are growing in stony skeletal soil. The site has a northerly aspect and is relatively open. The area is well drained and relatively dry, though supplementary watering is provided. Some plants are also growing successfully on much heavier soils at lower sites in the gardens.

The leaves of *G. willisii* are deeply pinnately lobed with a slight prickliness. The leaves can have 3–10 lobes but more commonly 5–7 lobes are present. They are a dull green above with the under-side of the leaf and the stiff, rigid stems covered with a dense tomentum of light-coloured hairs. The shrub when viewed from a distance has a grey-green appearance.

The flowers appear in spring in terminal spikes and are a cream colour with pale yellow styles¹. The fruits are attractive, with dark streaks developing on them as they mature.

The shrub is very attractive to birds, providing nesting sites in its dense, prickly foliage. Its flowers also provide a good food source for nectar feeders.

Propagation of this species has been carried out only from cuttings. Seed has not yet been tried. The best results have been with cuttings taken during April–May and treated with a high concentration of rooting hormone (indole butyric acid). Cuttings may take from two to five months to strike.

Some chlorosis of the leaves has been noted but not enough to detract from the plant.

Leaf miners occasionally attack this species.

Geoff Butler

¹ RHS colour chart, 1966: close to green-yellow group 1C.

MELALEUCA SPATHULATA



Distribution

Melaleuca is a large genus of about 140 species, belonging to the family Myrtaceae. All are endemic to Australia, except one which extends into South-East Asia and the South Pacific. They vary from small shrubs to trees, and are found in a great variety of habitats.

M. spathulata, from the Stirling and Eyre districts of Western Australia, is a showy, erect, but compact shrub growing to 1.5 m by 1.5 m. The dark green leaves are obovate-spathulate, 6–8 mm long, with a short petiole. The foliage is held on slender rigid upright branches that have an attractive contorted appearance, with the light grey papery bark contrasting well with the dark foliage.

The 20 mm diameter, bright mauve¹ flowers, are 'pom-pom' shaped, and appear profusely in terminal clusters, from October to December. The small globular fruits may be pruned after flowering to encourage new growth and hence more flowering for the following year.

M. spathulata occurs naturally on sand plains and gravelly hillsides, and in cultivation grows best in a well-drained sunny position. At

the National Botanic Gardens, however, it has also grown well in heavier soils, with the oldest plants being established in 1972. These have shown no frost damage or pest and disease problems.

Propagation from seed is described in *Growing Native Plants* No. 2. Mature seed capsules should be selected and stored in a warm place in a paper bag until the seed is released. Sow the seed in spring and prick out when the seedlings are large enough to handle. The plant may also be propagated from cuttings taken in late summer to early autumn when the new growth has begun to harden.

M. spathulata would be an asset in any garden, especially the low maintenance garden, where it adds colour in spring and an interesting form throughout the year. It also makes a useful tub specimen. It has been available commercially for some years and there should be little difficulty in acquiring a plant from a nursery specialising in native plants.

Stuart Donaldson

¹ RHS Colour Chart, 1966: red-purple group 68A.



Melaleuca spathulata:
Melaleuca—from the Greek, *melas*, meaning black, and *leukos*, white;
spathulata—from the Greek, *spathe*, and the Latin, *spatha*, a spatula, referring to the leaf shape.



SOLANUM LACINIATUM



Distribution

Solanum is the type genus of the family Solanaceae, which contains such well-known economic plants as the potato, tomato, tobacco, egg plant (aubergine) and many more. In Australia there are 93 native species (of which 87 are endemic) and 32 introduced species, a total of 125 in all.

S. laciniatum or kangaroo apple, a common name shared with the closely related *S. aviculare*, occurs in temperate regions of New South Wales, the Australian Capital Territory, Victoria, Tasmania, New Zealand and associated islands on a range of soil types. It forms a large shrub 4 m high by 5 m wide.

S. laciniatum produces two types of foliage: large lance-shaped or irregularly lobed juvenile leaves 300 mm long by 250 mm wide and smaller generally entire lance-shaped adult leaves 150 mm long by about 30–50 mm wide. Both types of leaf are a rich dark green on the upper surface, and a lighter green underneath, with conspicuous veins. They are held on dark green succulent stems, which turn black, then a rough light-brown, with age.

The 5-petalled flowers are 30–50 mm across, bluish-purple¹, with bright yellow anthers.

The flowers appear spasmodically in spring–summer in clusters of 3–5 in the leaf axils. The egg-shaped berries, 20–30 mm long, are a bright orange-yellow with a warty appearance when ripe.

S. laciniatum has been cultivated at the National Botanic Gardens since 1969, with no frost damage or major pest or disease problems apparent.

As a fast-growing species, hardy in most soil types and conditions, except salt spray, *S. laciniatum* is ideally suited as a screen plant, in the understorey of a wind break, or for bank and erosion stabilisation.

It has also been used in soils with a high concentration of heavy metals when reclaiming mine wastes. *Solanum* species are earlier colonisers of cleared or disturbed areas, such as roadways. In cultivation they are relatively short-lived shrubs, with a life expectancy of

5–6 years in good conditions. Older plants tend to split at the base, which allows wood rot fungi to take hold. Such splitting could be prevented to a large degree by corrective pruning from an early age.

Propagation may be from seeds, which require no pretreatment, or from cuttings taken from spring to autumn.

Since the mid 1960s *S. laciniatum* and *S. aviculare* have been cultivated and studied in the USSR, NZ, India, Egypt and other countries. The plants, and in particular the young foliage, contain a series of steroids which are of commercial value as raw material for the manufacture of contraceptives.

For the home gardener *S. laciniatum* is ideal as a quick growing screen plant, while slower shrubs are establishing. It may be hard to obtain through garden centres.

Stuart Donaldson

¹ RHS Colour Chart, 1966: violet-blue group 90C.

Solanum laciniatum:

Solanum—from the Latin, solamen, meaning to solace or comfort, referring to the narcotic properties of some species; *laciniatum*—from the Latin, *lacinia*, meaning a lappet or flap of a garment, referring to the lobed leaves.



POLYSCIAS SAMBUCIFOLIA

Syn. *Tieghemopanax sambucifolius*



Belonging to the family Araliaceae, the graceful *Polyscias sambucifolia*, commonly known as elderberry panax, is a very variable shrub to 3 m or more. It is found in forested coastal to sub-alpine regions in New South Wales, Victoria, the Australian Capital Territory and Queensland receiving 600–900 mm rainfall. At least three distinct forms of *P. sambucifolia* occur. The tallest is generally a fine compound-leaved shrub of spreading and upright habit usually found in coastal areas. Coarser, broader leaved forms may be found in mountains and coastal regions. In sub-alpine habitats, leaves may be intermediate in size, grey-green and paler beneath. The sub-alpine shrubs may reach a height of less than 2 m, with a tendency to sucker.

The leaves of *P. sambucifolia* are pinnate or bipinnate with individual leaflets opposite and toothed or toothed only in juvenile foliage. Leaf and width are very variable. The finer leaved forms may be linear and 20–40 mm by 2–3 mm. Those with broader leaves may have oblong acute leaflets 30–130 mm by 10–50 mm. Intermediate forms also exist, making it difficult to recognise this species in the wild.

P. sambucifolia is an attractive foliage plant which produces blue-grey¹ succulent fruit in summer. The flowers, although borne in large sprays from September to December, are pale green¹ and insignificant.

It is well suited to cool moist gardens and the suckering habit of the alpine form may be useful in producing a dense screen-like effect. This growth could easily be controlled if desired. Lateral branching is usually to ground level, producing a 'bushy' shrub.

Propagation is by cuttings or seed. Vegetative propagation from cuttings taken in summer to autumn for the reproduction of selected forms is recommended.

The attractive dense foliage and summer fruit, the excellent tolerance of some forms to cold conditions, and the ability to grow in all but very sandy soils make this relatively unknown native plant one to be recommended for

Polyscias sambucifolia:
Polyscias—from the Greek words, poly, meaning many, and skias, meaning shade, possibly referring to the shade from many leaves;
sambucifolia—referring to leaves which resemble those of *Sambucus*, the elderberry.



garden use provided that it receives adequate water.

The fine-leaved coastal form may have some applications as an indoor plant.

Barrie Hadlow

¹ RHS Colour Chart, 1966: prominent ovary, close to yellow-green group 144C; mature fruit, greyed-white group 156A.

EUCALYPTUS PARVIFOLIA



Distribution

This small-leaved tree is one of the most compact of the eucalypt species, having a rounded shape with branches close to the ground. *E. parvifolia* is an ideal specimen tree for small gardens. It is also useful in groups for wind protection or in hedge-type rows for privacy. It is an excellent tree for cold damp positions.

In its natural habitat *E. parvifolia* is restricted to the high country of south-eastern New South Wales. A fine stand can be seen at the head waters of the Tuross River, north-east of Kybean towards Nimmitabel. *E. parvifolia* grows in the valleys where the soil is poorly drained and where conditions are cold, with frost, snow and heavy mist.

In its natural state it can grow to 10 m in height and may be greater in width. The trunk, which may be single or divided, sheds its bark in thin strips, leaving a smooth dark-grey surface with a 100 mm collar of hard deeply ridged bark at the base.



A distinctive feature of this species is that mature trees retain their juvenile leaves, which are opposite and approximately 25 mm long. Several specimens have been growing in the National Botanic Gardens since 1971 but to date only one has started to produce intermediate leaves and there has been no sign of flower buds. Flowering occurs from January to March in the wild and the fruit stays tightly packed along the stems.

Propagation is by seed, which at a temperature of 25°C takes 5–10 days to germinate. The seedlings should be pricked out into large containers as soon as they can be handled, and when strong enough planted out into a permanent position in spring.

Because of their ability to grow in waterlogged areas, *E. parvifolia* should be watered well in summer to maintain optimum condition.

E. parvifolia seems to be much freer from pests and diseases than many other eucalypts. It does not appear to suffer significantly from insect-eating beetles and although scale has been observed, it can be controlled by spraying with white oil and malathion when new infestations occur.

Nora Ollerenshaw

Eucalyptus parvifolia:
Eucalyptus—from the Greek, *eu*, meaning well, and *kalyptos*, meaning covered, alluding to the cap or lid which covers the stamens in bud; *parvifolia*—from the Latin, *parvis*, meaning little, and *folium*, meaning leaf.

TASMANIA PURPURASCENS



Distribution

Tasmannia purpurascens is a useful foliage plant 1–3 m high and 1.5 m wide. It was first described in 1937 by J. W. Vickery as *Drimys purpurascens* and is often listed under this name in older literature. *Tasmannia* is of particular interest to botanists as it is a member of the primitive family Winteraceae. Members of the genus have been given the common name pepper bushes because of the hot-flavoured fruit, seeds and sometimes foliage, which have been used as a condiment. The distribution of *T. purpurascens* is limited to the Gloucester Tops and Barrington Tops in the Central Tablelands of New South Wales, where it grows abundantly at 1300 m in moist *Eucalyptus* forest. Frosts are common in winter and snow is not unknown. Fogs and misty rain can occur throughout the year.

Although the plant seems adaptable to a range of situations it favours the protection of trees and can grow in deep shade. In cultivation *T. purpurascens* grows best on freely draining soil with good moisture retention although it can grow in quite heavy soil. Reasonably high moisture levels are required both in summer and winter for healthy growth. As they grow slowly they respond to a light application of general fertiliser in spring and early autumn.

The most attractive feature of the plant is its large 100–200 mm long leaves. They are ob lanceolate; pointed at the apex, widening to 20–70 mm about one-third the way along the blade and tapering from there back to the flattened leaf base. The leaves are dark glossy green on the upper surface and slightly paler underneath, with a purple raised midrib. The appeal of the foliage is enhanced by the reddish-purple colouring of the tip growth and the reddish stems.

The creamy white¹ flowers are 25 mm in diameter and are borne in pseudo-terminal or axillary umbels. Individual flowers are either male or female but both appear on the same plant. The fruit, consisting of 3–4 free succulent berries, deep blackish purple in colour and



Tasmannia purpurascens:
Tasmannia—After Abel Jansen Tasman, navigator, for whom Tasmania was named;
purpurascens—becoming purple, referring to the reddish-purple midrib of the leaf.

10–15 mm long, remain on the plant for some time, adding to the overall attractiveness of this species.

T. purpurascens does not attract many pests and diseases, although in glasshouse and indoor situations it may be attacked by mealy bug, which may distort the foliage. Thrip has also been seen to damage leaves and cause defoliation in the open garden. Plants are readily propagated from cuttings in early autumn. Propagation from seed has been difficult. Tip pruning of young plants, especially those in deep shade, will help keep a rounded bushy appearance.

The slow growth, attractive foliage and fruit and a high tolerance to low light make *T. purpurascens* an ideal indoor plant. It could also be used to effect as an outdoor pot plant in shade or in a fernery.

Brian Casey

¹ RHS Colour Chart, 1966: petals, close to yellow group 9D; stamens, yellow orange group 14C.

DORYANTHUS EXCELSA



Distribution

Doryanthes excelsa is an unusual plant which makes a striking addition to a large garden. Occurring naturally along the central coast of New South Wales, it has several popular names which reflect its size, appearance and distribution—giant lily, flame lily, spear lily, Illawarra lily, Gymea lily. A member of the family Agavaceae, *D. excelsa* belongs to an endemic genus of two species, of which it is the more widely cultivated. The other species, *D. palmeri*, occurs in the McPherson Ranges of south-eastern Queensland.

Each plant grows from a thickened underground stem which is gradually pulled deeper and deeper into the ground by the roots contracting during periods of dry weather. For this reason the plants do best in deep soil. The plant forms a large clump with numerous sword-like fibrous leaves, to 1 m in length and up to 100 mm wide. The red¹, trumpet-like flowers each 100 mm across are borne in a compact terminal head 300 mm in diameter on a leafy flowering stem 2–4 m high. For this reason, and because they are surrounded by brown bracts, the flowers are not seen clearly from the ground. Flowering occurs from October to November in Canberra. The fruit is a woody capsule which splits open on ripening in January or February to release the brown, flattened and slightly winged seeds.

Suitable for large rockeries and gardens, *D. excelsa* makes an interesting foliage plant, but must be sited with care to ensure a well-drained, deep soil, in full sun or partial shade. An ideal position would be below an elevated patio where its tall flower spike can be appreciated. The plant needs to be kept well watered. In spring a small quantity of blood and bone or a slow release fertiliser should be applied.

Propagation is by division of established plants or from seed. Seed will germinate readily within 2 months if only a year or two old and is best sown in autumn. However, plants grown from seed will not flower until about 8 years of age.

Although the foliage is resistant to frost damage, the developing flowerbuds need protection, particularly if seed collection is planned. At the National Botanic Gardens this protection is provided by a hessian-covered frame at the top of a tall pipe and mounted over the flowerbuds.

D. excelsa is seldom attacked by pests or diseases, although the flower-head may occasionally be damaged by birds feeding on its nectar.

Julia Rymer

¹ RHS Colour Chart, 1966: close to red group 46C.



Doryanthes excelsa:
Doryanthes—a composite of two Greek words, *doratos*, meaning spear, and *'anthos'* meaning flower;
excelsa—derived from the Latin, *excelsus*, meaning high or lofty.

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AUTHORSHIP Articles for *Growing Native Plants* are supplied by trained horticultural staff at the National Botanic Gardens. The Editor is the former Curator of the Gardens, John Wrigley. Photographs for this volume were supplied by Anne Boden, Murray Fagg, Chris Green, Ron Hotchkiss and Col Totterdell. The drawing on the title page is by Fay Davies.

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Back cover: Christmas beetles, *Anoplognathus* spp., may cause extensive defoliation of eucalypts.

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